



# Cleveland Climate Action Plan: Green Jobs / Workforce Development Analysis

Appendix B

# Defining and Tracking Green Jobs: Methodology and Baseline Results

## Overview

A cross-cutting objective of the Climate Action Plan (CAP) is workforce development to support “green jobs.” This appendix provides a summary of the methodology used to develop a baseline count of green jobs in Cleveland, and a proposed approach for ongoing monitoring. It begins with a summary of the analysis outcomes, followed by more detailed discussion of green jobs and the methodology used to establish a baseline.

For purposes of this analysis, “green jobs” are defined as jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources, as well as jobs in which workers’ duties involve making their establishment’s production processes more environmentally friendly or use fewer natural resources. Many of the CAP objectives and actions have the potential to impact employment in green jobs, and establishing a baseline and consistent methodology for monitoring will help determine the impact that implementation of the CAP has on employment over time.

The source of the employment data is JobsEQ, a service provided by Chmura Analytics, that references quarterly wage and employment data from the Bureau of Labor Statistics. In summary, green jobs are an important but difficult sector to monitor due to wide variations in definitions and data availability. The methodology used for Cleveland is a top-down approach that focuses on monitoring employment trends in industries where green jobs are most likely and prevalent; it is not a bottom-up count of individual green jobs due to data limitations at the local level. Furthermore, the industries selected for monitoring closely align with the CAP focus areas, objectives, and actions.

This top-down approach is supplemented by other reports and studies that provide more granular data at the local and occupation levels. Over time, a local employment survey would be a valuable addition to supplement this methodology in order to gather more detailed information on green job employment. The survey could be administered in coordination with business license or sales tax registration and renewals, or by local economic development partners; and could ask businesses about their green practices, whether or not they consider themselves providers of green jobs, and their employment trends.

## Analysis Summary

In 2017, approximately 5% of Cleveland’s workforce was employed in industries that align closely with the CAP focus areas. On average, the average annual wages of workers in these industries in Cleveland were \$7,170 greater (or 13% greater) than average annual wages of workers in all industries in Cleveland. Looking to the next decade, forecasts show that total employment across the City of Cleveland may continue to decline, but that these focus area-aligned industries are expected to grow slightly.

## Energy Efficiency and Green Building

Green jobs in this focus area include products and services related to improving energy efficiency and building performance. See page 7 for a detailed list of industries to monitor.

In 2017, total employment in these industries was 6,276 and average annual wages were \$68,038.

Investments in energy efficiency programs has co-benefits of creating construction and trade jobs required to implement the energy efficiency measures and reducing resident's utility bills. The money saved on utility bills is then reinvested in the local economy stimulating further job growth. Nation-wide it has been found that investment in energy efficiency has higher job creation potential than renewable energy or fossil fuel industries with energy efficiency investment creating 7.7 full-time jobs for every \$1 million invested while renewable energy and fossil fuel investments create 7.5 and 2.7 full time jobs respectively (US Congress Joint Economic Committee).

### Clean Energy

Green jobs in this focus area include products and services related to the generation of electricity, heat, or fuel from renewable sources. See page 7 for a detailed list of industries to monitor.

In 2017, total employment in these industries was 73 and average annual wages were \$82,832. Note that these industries encompass the manufacturing of clean energy equipment and installation at a large (utility) scale, but that the installation of building-scale equipment is likely included in the electrical contractor industry (and as such is included with Energy Efficiency and Green Building employment figures).

The Solar Foundation Annual Solar Census is another good resource for monitoring solar industry employment by county each year. According to the Solar Jobs Census, there were 586 solar jobs in Cuyahoga County in 2017 (The Solar Foundation). Note that data are unavailable from this source for the City of Cleveland.

### Sustainable Transportation

Jobs in this focus area include products and services related to the efficient movement of people and goods. See page 8 for a detailed list of industries to monitor.

In 2017, total employment in these industries was 2,603 and average annual wages were \$67,229.

Investment in sustainable transportation, especially public transit, is a cost-effective way for the City to create local jobs. An analysis of the impact of investment in regional transport projects showed that cities that invested in public transit projects created more jobs per dollar than cities that invested in traditional road infrastructure. This study looked at 20 metropolitan areas around the US and found that by shifting 50% of transportation funding from highways to public transit, the cities would see an average net increase in jobs of about 5% (Swanstrom, Winter and Wiedlocher).

### Clean Water and Vibrant Green Space

Jobs in this focus area include products and services that improve water quality and conserve natural resources. See page 8 for a detailed list of industries to monitor.

In 2017, total employment in these industries was 3,754 and average annual wages were \$53,792.

One potential source for green jobs in this focus area is in the design, construction, and maintenance of the planned green infrastructure to be installed by NEORS to manage stormwater runoff. According to a study of the potential impacts of the green infrastructure plan, 219 sustained jobs funded through NEORS will be created. The study also notes that these jobs have potential to be used in workforce development. Since many of these new jobs are low-skilled labor jobs, they can be used as an opportunity for workforce training for community members with barriers to employment such as low educational attainment, learning disabilities, or other barriers to employment (Green For All).

## More Local Food, Less Waste

Jobs in this focus area include products and services related to agriculture and local food production, as well as waste reduction, recycling, and remediation. See page 9 for a detailed list of industries to monitor.

In 2017, total employment in these industries was 1,545 and average annual wages were \$53,427.

Shifting food spending to local vendors and suppliers through the CAP objectives will help keep this money local and help generate green jobs for Clevelanders. In a 2014 study of the food business cluster in NEO, it was estimated that shifting 10% of the \$10.7 billion spent annually on food and beverage in northeast Ohio to local providers and vendor could create about 1,500 jobs (Bush Consulting Group).

## Green Jobs Background

Across the United States, “green jobs” has been a growing sector, although monitoring is a process that is inconsistent, especially at the local level. In 2012, the Bureau of Labor Statistics (BLS) developed a more consistent definition and approach for monitoring green jobs.

The Bureau of Labor Statistics defines green jobs as the following:

- Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources.
- Jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources.

To measure green jobs, BLS reviewed the detailed (6-digit) North American Industry Classification System (NAICS) industries, and identified which ones have jobs related to the production of green goods and services. The Green Goods and Services (GGS) survey pulled from the BLS Quarterly Census of Employment and Wages (QCEW) program and reported the number of jobs associated with the production of green goods and services by industry. Note that this data was available for the United States, states, and the District of Columbia. The 2011 GGS results were released, but the GGS program was eliminated in 2013 due to budget cuts, ongoing GGS data monitoring has not continued.

Since that time, many communities and organizations have developed their own methodologies and approaches for defining and monitoring green jobs. Our team has reviewed various approaches and methodologies in order to inform the development of an approach that is replicable, relevant, and right-sized for the Cleveland Climate Action Plan.

Note that the proposed approach focuses on tracking employment in industries that are most likely to encompass goods, services, and occupations that are “green.” The employment levels and growth in the identified industries are not an exact count of “green jobs” at any point in time, but are used as an indicator of the likely trends in the number of green jobs supported by the Cleveland economy.

In summary, the approach for Cleveland starts with the list of 6-digit NAICS codes developed by the BLS for its GGS survey. It then refreshes the list to include the latest detailed NAICS codes and decisions about whether or not to categorize them as GGS. Note that the approach proposed includes tracking all of the industries categorized as GGS by the BLS, as well as more detailed monitoring of select industries that are particularly relevant in Cleveland and related to the Climate Action Plan’s focus areas.

The approach leverages the Chmura platform to pull detailed QCEW data for the selected industries. It is recommended that this process is conducted annually at a minimum; but quarterly data are available.

Furthermore, this quantitative approach is supplemented by a more qualitative exercise of tracking other reports, studies, and news reports that provide additional and sometimes more granular local or industry-specific information. Together these approaches help illustrate the overall employment trends in industries where green jobs are most likely as well as industries that will likely be influenced by implementation of the Climate Action Plan.

Over time, it is recommended that the City of Cleveland and/or its regional partners undertake a local employment survey to gather more detailed information on specific occupations and workforce development opportunities and needs in the green job arena.

## Methodology Part 1: All Green Goods and Services Industries

For Cleveland's analysis, the methodology starts with identifying and collecting data for all industries where Green Goods and Services are most prevalent. The trends in these industries for the City of Cleveland and Cuyahoga County levels are then compared to overall employment trends for these areas. Note that this approach does not include detailed analysis of the specific occupations within each industry, and as such, the values represent employment industries where green jobs are likely and prevalent, not definitive counts of only green jobs.

### Step 1: Determine Industries to Track

- A. Download the 2012 NAICS codes identified as Green Goods and Services from the Bureau of Labor Statistics: Green Good and Services webpage.<sup>1</sup> The [Excel spreadsheet \(XLS\)](#) file can be found under the section *"What North American Industrial Classification System (NAICS) codes are considered green according to the BLS GGS survey definition?"*
- B. After obtaining the 2012 GGS spreadsheet, obtain the most recent version of NAICS codes which can be found [here](#). Note that revisions to NAICS occurred in 2017 and are scheduled again for 2022.
- C. Compare the 2012 NAICS 6-digit industries that are identified as Green Goods and Services to the updated list of NAICS 6-digit codes. Determine which NAICS codes are new or revised and need to be screened for including in the Green Goods and Services category.
- D. Evaluate any new/revised categories to include in the Green Goods and Services category against the following criteria:
  - ***Does the industry encompass one or more of the following? If yes, the industry should be included in the Green Goods and Services category. If not, it should be excluded.***
    - ***Energy from renewable sources.*** Electricity, heat, or fuel generated from renewable sources. These energy sources include wind, biomass, geothermal, solar, ocean, hydropower, and landfill gas and municipal solid waste.
    - ***Energy efficiency.*** Products and services that improve energy efficiency. Included in this group are energy-efficient equipment, appliances, buildings, and vehicles, as well as products and services that improve the energy efficiency of buildings and the efficiency of energy storage and distribution, such as Smart Grid technologies.
    - ***Pollution reduction and removal, greenhouse gas reduction, and recycling and reuse.***  
These are products and services that:
      - Reduce or eliminate the creation or release of pollutants or toxic compounds or remove pollutants or hazardous waste from the environment.

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<sup>1</sup> <https://www.bls.gov/ggs/ggsfaq.htm#2>

- Reduce greenhouse gas emissions through methods other than renewable energy generation and energy efficiency, such as electricity generated from nuclear sources.
  - Reduce or eliminate the creation of waste materials; collect, reuse, remanufacture, recycle, or compost waste materials or wastewater.
  - **Natural resources conservation.** Products and services that conserve natural resources. Included in this group are products and services related to organic agriculture and sustainable forestry; land management; soil, water, or wildlife conservation; and storm water management.
  - **Environmental compliance, education and training, and public awareness.** These are products and services that:
    - Enforce environmental regulations.
    - Provide education and training related to green technologies and practices.
    - Increase public awareness of environmental issues.
- E. Document this list of Green Goods and Services industries selected for data collection.

## Step 2: Collect Data

- A. Access the Chmura Analytics platform using the Cuyahoga County Department of Development login.
- B. Using the Chmura platform, run Snapshot Reports for **all industries** for the most recent period available for the City of Cleveland and Cuyahoga County.
- C. Input the list of NAICS 6-digit codes for Green Goods and Services industries into the Chmura platform.
- D. Run Data Explorer (Industry Data Set) for the most recent period available for City of Cleveland and Cuyahoga County for the **selected Green Goods and Services industries**. The reports should include the following data:
  - a. Total Employment
  - b. Average Annual Wages per Worker

Run Industry Snapshot Reports for the most recent period available for City of Cleveland and Cuyahoga County for the **selected Green Goods and Service industries**. The reports should include the following data:

- c. 5 Year Employment Growth Forecast
  - d. 10 Year Employment Growth Forecast
- E. Download the results and add the worksheet pages to the CLE Green Jobs Analysis Workbook.

Note on data collection frequency: At a minimum, annual data collection is recommended (4<sup>th</sup> quarter of each calendar year; typically, available two quarters later). However, quarterly data collection is available. It is recommended that the actual numbers reported to BLS are used rather than the Chmura preliminary estimates.

## Step 3: Summarize and Report

- A. Sum the total current employment for all Green Goods and Services industries. This total represents the **total employment in industries where green jobs are most prevalent**. Over time, increases represent employment growth in industries that have high numbers of green jobs and services. Decreases represent declines in employment in industries that have a prevalence of green jobs and services. *Note the total is not a direct count of green jobs due to*

*the fact that not 100% of jobs in any one industry are guaranteed to be “green jobs” and similarly, some industries not included in the count may have some jobs that could be considered “green.”*

- B. Once the latest quarter/year worksheets are added to the workbook and summarized, add the summary results to the “Annual Summary” tab.

## Methodology Part 2: Focus Area Industries

In addition to tracking employment trends across the comprehensive list of Green Goods and Services industries, more detailed monitoring of a handful of industries that relate to each focus area of the Climate Action Plan will help illuminate the potential benefits and impacts of the Climate Action Plan’s implementation on Cleveland’s green economy.

As with the methodology described in Part 1, this monitoring approach focuses on industry-level employment and wages, not more detailed information about specific occupations. However, the focus area industries are selected based on their strong correlation with the objectives and actions in the Climate Action Plan, and as such, it is assumed that a significant portion of future job growth in these industries will be in “green” occupations.

### Step 1: Screen Industries for Relevance to Focus Areas

- A. The full list of GSS industries includes 321 6-digit level industries. To winnow this list down to a more manageable number, they were screened for the following factors:
  - a. Is the industry identified in another Green Job analysis methodology (e.g., City of San Diego’s Green Jobs Report)?
  - b. Is the industry related to one or more focus areas in the Cleveland Climate Action Plan and its related objectives and actions?
  - c. Is there any existing employment in this industry and/or is it an industry where growth resulting from the Climate Action Plan implementation is probable?
  - d. Are most of the occupations in the industry likely to be related to Green Goods and Services?
- B. If a majority of these factors were present, then they were flagged as an “industry to monitor.”

### Step 2: Assign Focus Area and Analyze

- A. For the industries flagged as ones to monitor, a focus area was assigned based on the relevance of the industry to the focus area and its associated objective and actions.
- B. The results from Part 1 can now be filtered by focus area, as follows.
- C. After the data for each focus area is filtered, calculate the weighted average of average annual wages per worker by dividing the product of the total employment and the average annual wages per worker by the total employment.
- D. Once the focus area data are filtered and summarized, add the summary results to the “Summary Stats” tab.
- E. Compare the total current employment in focus area industries to the total current employment in all industries. Determine the percentage of employment in the focus area industries by dividing the total employment for all industries by the total employment in focus area industries. Over time, increases in this percentage show an increasing share of local/county employment in industries that support green jobs.
- F. Compare the average annual wages for an area in the focus area industries against all industries to illustrate whether or not wages in focus area industries are on par with, higher, or lower than all industries.



- G. Compare the 5 and 10 year employment growth forecasts for all industries to focus area industries to determine whether employment in the focus area industries is expected to grow or decline at the same/higher/lower rate than all industries.

### Energy Efficiency and Green Building

Green jobs in this focus area include products and services related to improving energy efficiency and building performance. In the past 5 years, employment in the new construction and remodeling industries (residential and commercial) has grown considerably and present many opportunities for training and practices that promote energy efficient and green construction.

|           |   | Cleveland 2012Q4 |                          | Cleveland 2017Q4 |                          |                                 |                                  |
|-----------|---|------------------|--------------------------|------------------|--------------------------|---------------------------------|----------------------------------|
| 2017 Code | Title   | Empl             | Avg Ann Wages per Worker | Empl             | Avg Ann Wages per Worker | 5 Yr Employment Growth Forecast | 10 Yr Employment Growth Forecast |
| 236115    | New single-family general contractors         | 129              | \$57,271                 | 241              | \$65,052                 | 1                               | 3                                |
| 236116    | New multifamily general contractors           | 1                |                          | 4                | \$37,723                 | 0                               | 0                                |
| 236118    | Residential remodelers                        | 223              | \$41,860                 | 421              | \$40,913                 | 2                               | 4                                |
| 236210    | Industrial building construction              | 14               | \$66,452                 | 12               | \$76,936                 | 0                               | 0                                |
| 236220    | Commercial building construction              | 661              | \$62,875                 | 914              | \$70,755                 | 10                              | 19                               |
| 238211    | Residential electrical contractors            | 191              | \$43,451                 | 218              | \$41,037                 | 0                               | 0                                |
| 238212    | Nonresidential electrical contractors         | 778              | \$61,214                 | 729              | \$60,162                 | 2                               | 3                                |
| 238221    | Residential plumbing and HVAC contractors     | 363              | \$42,826                 | 512              | \$45,300                 | 19                              | 38                               |
| 238222    | Nonresidential plumbing and HVAC contractors  | 570              | \$65,369                 | 664              | \$72,465                 | 27                              | 56                               |
| 335121    | Residential electric lighting fixture mfg.    | 38               | \$46,685                 | 20               | \$56,923                 | -2                              | -4                               |
| 335122    | Nonresidential electric lighting fixture mfg. | 40               | \$36,834                 | 26               | \$39,431                 | -2                              | -4                               |
| 335129    | Other lighting equipment manufacturing        | 1                | \$66,507                 | 5                | \$75,327                 | 0                               | -1                               |
| 541310    | Architectural services                        | 559              | \$69,224                 | 668              | \$74,979                 | -1                              | -1                               |
| 541330    | Engineering services                          | 1,926            | \$74,398                 | 1,842            | \$82,312                 | 32                              | 64                               |
|           |   | 5,494            | \$64,296                 | 6,276            | \$68,038                 | 88                              | 177                              |

Source: [JobsEQ®](#)

### Advanced and Renewable Energy

Green jobs in this focus area include products and services related to the generation of electricity, heat, or fuel from renewable sources. Employment in these industries is limited, but implementation of the Climate Action Plan will likely result in growth that is greater than projected.

|           |  | Cleveland 2012Q4 |                          | Cleveland 2017Q4 |                          |                                 |                                  |
|-----------|--|------------------|--------------------------|------------------|--------------------------|---------------------------------|----------------------------------|
| 2017 Code | Title  | Empl             | Avg Ann Wages per Worker | Empl             | Avg Ann Wages per Worker | 5 Yr Employment Growth Forecast | 10 Yr Employment Growth Forecast |
| 221111    | Hydroelectric power generation               | 0                |                          | 1                | \$11,955                 | 0                               | 0                                |
| 221114    | Solar electric power generation              | 0                |                          | 0                |                          |                                 |                                  |
| 221115    | Wind electric power generation               | 0                |                          | 0                |                          |                                 |                                  |
| 221116    | Geothermal electric power generation         | 0                |                          | 0                |                          |                                 |                                  |
| 221117    | Biomass electric power generation            | 0                |                          | 0                |                          |                                 |                                  |
| 221118    | Other electric power generation              | 0                |                          | 0                |                          |                                 |                                  |
| 237130    | Power and communication system construction  | 10               | \$103,582                | 8                | \$108,009                | 1                               | 2                                |
| 333611    | Turbine and turbine generator set units mfg. | 0                |                          | 0                |                          |                                 |                                  |



|        |   |    |          |    |          |    |     |
|--------|---|----|----------|----|----------|----|-----|
| 335311 | Electric power and specialty transformer mfg. | 54 | \$85,563 | 48 | \$84,536 | -4 | -8  |
| 335911 | Storage battery manufacturing                 | 0  |          | 4  | \$75,755 | 0  | -1  |
| 335912 | Primary battery manufacturing                 | 1  | \$71,949 | 0  |          | 0  | 0   |
| 926130 | Utility regulation and administration         | 16 | \$60,090 | 12 | \$67,495 | 0  | -1  |
|        |   | 81 | \$82,588 | 73 | \$82,832 | -4 | -10 |

Source: [JobsEQ®](#)

## Sustainable Transportation

Jobs in this focus area include products and services related to the efficient movement of people and goods. In the past five years, employment in these industries has declined but implementation of the Climate Action Plan and reinvestment in transit and a shift to cleaner vehicles could spur new employment activity.

|           |  | Cleveland 2012Q4 |                          | Cleveland 2017Q4 |                          |                                 |                                  |
|-----------|--|------------------|--------------------------|------------------|--------------------------|---------------------------------|----------------------------------|
| 2017 Code | Title  | Empl             | Avg Ann Wages per Worker | Empl             | Avg Ann Wages per Worker | 5 Yr Employment Growth Forecast | 10 Yr Employment Growth Forecast |
| 485111    | Mixed mode transit systems                   | 1,660            | \$74,567                 | 1,376            | \$79,265                 | -6                              | -11                              |
| 485112    | Commuter rail systems                        | 0                |                          | 0                |                          |                                 |                                  |
| 485113    | Bus and other motor vehicle transit systems  | 205              | \$90,380                 | 49               | \$101,855                | 0                               | 0                                |
| 485119    | Other urban transit systems                  | 0                |                          | 0                |                          |                                 |                                  |
| 485210    | Interurban and rural bus transportation      | 159              | \$30,028                 | 39               | \$30,953                 | -2                              | -3                               |
| 485410    | School and employee bus transportation       | 191              | \$26,868                 | 35               | \$12,378                 | -1                              | -1                               |
| 485510    | Charter bus industry                         | 30               | \$27,828                 | 4                | \$27,959                 | 0                               | 0                                |
| 485999    | All other ground passenger transportation    | 178              | \$26,125                 |                  | \$26,253                 | 15                              | 31                               |
| 811111    | General automotive repair                    | 424              | \$37,919                 | 528              | \$40,183                 | -5                              | -11                              |
| 811112    | Automotive exhaust system repair             | 57               | \$30,684                 | 26               | \$36,386                 | 0                               | -1                               |
| 811113    | Automotive transmission repair               | 60               | \$43,983                 | 32               | \$44,689                 | 0                               | -1                               |
| 811118    | Other automotive mechanical and elec. repair | 29               | \$33,838                 | 20               | \$37,328                 | 0                               | 0                                |
| 926120    | Transportation program administration        | 641              | \$67,058                 | 494              | \$70,538                 | -22                             | -42                              |
|           |  | 3,634            | \$61,126                 | 2,603            | \$67,229                 | -21                             | -39                              |

Source: [JobsEQ®](#)

## Clean Water and Green Space

Jobs in this focus area include products and services that improve water quality and conserve natural resources. Employment appears to be increasing in some of these industries, but declining in others. Emphasizing stormwater management, clean water, and green spaces will likely bolster employment in these industries in the future.

|           |  | Cleveland 2012Q4 |                          | Cleveland 2017Q4 |                          |                                 |                                  |
|-----------|--|------------------|--------------------------|------------------|--------------------------|---------------------------------|----------------------------------|
| 2017 Code | Title  | Empl             | Avg Ann Wages per Worker | Empl             | Avg Ann Wages per Worker | 5 Yr Employment Growth Forecast | 10 Yr Employment Growth Forecast |
| 111421    | Nursery and tree production                  | 4                | \$30,898                 | 2                | \$38,060                 | 0                               | 0                                |
| 113110    | Timber tract operations                      | 0                |                          | 0                |                          |                                 |                                  |
| 113210    | Forest nursery and gathering forest products | 0                |                          | 0                |                          |                                 |                                  |
| 115310    | Support activities for forestry              | 0                |                          | 2                | \$17,582                 | 0                               | 0                                |
| 221310    | Water supply and irrigation systems          | 998              | \$60,020                 | 577              | \$65,093                 | 1                               | 2                                |
| 221320    | Sewage treatment facilities                  | 315              | \$52,056                 | 584              | \$59,085                 | 1                               | 2                                |
| 237110    | Water and sewer system construction          | 186              | \$62,310                 | 296              | \$72,736                 | 29                              | 62                               |
| 541320    | Landscape architectural services             | 30               | \$47,139                 | 43               | \$41,241                 | 0                               | 0                                |

|        |  |       |          |       |          |     |     |
|--------|--|-------|----------|-------|----------|-----|-----|
| 541620 | Environmental consulting services            | 23    | \$53,421 | 46    | \$65,278 | 2   | 4   |
| 561730 | Landscaping services                         | 437   | \$31,693 | 609   | \$36,670 | 5   | 10  |
| 712190 | Nature parks and other similar institutions  | 62    | \$50,131 | 50    | \$56,149 | 2   | 4   |
| 813312 | Environment and conservation organizations   | 97    | \$34,736 | 89    | \$45,515 | 1   | 3   |
| 924110 | Air, water, and waste program administration | 709   | \$58,485 | 842   | \$64,248 | -20 | -39 |
| 924120 | Administration of conservation programs      | 457   | \$30,562 | 614   | \$32,842 | -15 | -30 |
|        |  | 3,318 | \$50,155 | 3,754 | \$53,792 | 6   | 18  |

Source: [JobsEQ®](#)

### More Local Food, Less Waste

Jobs in this focus area include products and services related to agriculture and local food production, as well as waste reduction, recycling, and remediation. Increased emphasis on local food products, waste reduction activities, and waste diversion through the Climate Action Plan implementation will likely help retain and grow employment in these industries.

| 2017 Code | Title                                    | Cleveland 2012Q4 |                          | Cleveland 2017Q4 |                          |                                 |                                  |
|-----------|--|------------------|--------------------------|------------------|--------------------------|---------------------------------|----------------------------------|
|           |  | Empl             | Avg Ann Wages per Worker | Empl             | Avg Ann Wages per Worker | 5 Yr Employment Growth Forecast | 10 Yr Employment Growth Forecast |
| 111419    | Other food crops grown under cover       | 2                | \$20,713                 | 3                | \$24,039                 | 0                               | 0                                |
| 111998    | All other miscellaneous crop farming     | 0                |                          | 1                | \$21,893                 | 0                               | 0                                |
| 112519    | Other aquaculture                        | 0                |                          | 0                |                          |                                 |                                  |
| 423930    | Recyclable material merchant wholesalers | 537              | \$54,255                 | 423              | \$58,296                 | 15                              | 30                               |
| 453310    | Used merchandise stores                  | 164              | \$16,851                 | 160              | \$19,312                 | 16                              | 34                               |
| 562111    | Solid waste collection                   | 99               | \$41,328                 | 104              | \$49,718                 | 8                               | 16                               |
| 562112    | Hazardous waste collection               | 2                | \$53,519                 | 16               | \$53,149                 | 1                               | 3                                |
| 562119    | Other waste collection                   | 13               | \$59,376                 | 21               | \$54,909                 | 2                               | 3                                |
| 562211    | Hazardous waste treatment and disposal   | 33               | \$60,269                 | 44               | \$66,872                 | -6                              | -11                              |
| 562212    | Solid waste landfill                     | 107              | \$57,031                 | 155              | \$58,249                 | -21                             | -38                              |
| 562213    | Solid waste combustors and incinerators  | 18               | \$71,276                 | 0                |                          | 0                               | 0                                |
| 562219    | Other nonhazardous waste disposal        | 303              | \$46,676                 | 304              | \$57,957                 | -39                             | -73                              |
| 562910    | Remediation services                     | 329              | \$50,838                 | 130              | \$62,781                 | 8                               | 17                               |
| 562920    | Materials recovery facilities            | 42               | \$47,774                 | 51               | \$58,668                 | 3                               | 6                                |
| 562998    | Miscellaneous waste management services  | 105              | \$44,238                 | 133              | \$51,006                 | 9                               | 20                               |
|           |  | 1,754            | \$47,779                 | 1,545            | \$53,427                 | -4                              | 7                                |

Source: [JobsEQ®](#)

## 2017 Baseline Results

The following tables provide a baseline of results as of the 4<sup>th</sup> quarter of 2017 using the methodology described in Part 1 and Part 2.

### *City of Cleveland*

| <b>CITY OF CLEVELAND</b>                | <b>Q4 2012</b> | <b>Q4 2017</b> | <b>% Change<br/>(2012-2017)</b> |
|---|----------------|----------------|---------------------------------|
| <b>Employment</b>                       |                |                |                                 |
| Total - All Industries                  | 257,887        | 276,837        | 7%                              |
| Green Jobs Industries                   | 57,821         | 60,938         | 5%                              |
| Focus Area Industries                   | 14,281         | 14,251         | 0%                              |
| <b>Avg Ann Wages per Worker</b>         |                |                |                                 |
| Total - All Industries                  | \$50,930       | \$55,459       | 9%                              |
| Green Jobs Industries                   | \$68,990       | \$74,210       | 8%                              |
| Focus Area Industries                   | \$58,279       | \$62,629       | 7%                              |
| <b>5 Yr Employment Growth Forecast</b>  |                |                |                                 |
| Total - All Industries                  | n/a            | -1,807         |                                 |
| Green Jobs Industries                   | n/a            | -656           |                                 |
| Focus Area Industries                   |                | 65             |                                 |
| <b>10 Yr Employment Growth Forecast</b> |                |                |                                 |
| Total - All Industries                  | n/a            | -3,602         |                                 |
| Green Jobs Industries                   | n/a            | -1,306         |                                 |
| Focus Area Industries                   | n/a            | 153            |                                 |

[Source: JobsEQ®](#)

### Summary Observations for the City of Cleveland:

- 5% of Cleveland's workers are employed in the industries that align with the CAP focus areas.
- Wages in these focus area industries are 13% higher (or an average of \$7,170 more) than those of all industries.
- Employment forecasts show a decline in employment for all industries in the next decade but the focus area industries are forecasted to have increasing employment.

## Methodology Part 3: Qualitative Monitoring

In addition to quantitative monitoring of Green Jobs per the methodology detailed earlier, it is recommended that the City of Cleveland conduct additional qualitative monitoring and documentation of Green Jobs. A Supplemental Tracking worksheet is provided in the Green Jobs Analysis Workbook to document news articles, other studies/reports, and other information related to green job growth. In addition to documenting the date, source of information, and estimated number of new green jobs, users are encouraged to categorize the information under one or more Climate Action Plan focus areas, as well as provide additional details, quotations, and other information that might be useful about the data (e.g., business name, type of jobs/products, etc.).

This supplemental, qualitative information will be used to help provide illustrative examples of the quantitative results. They can also be used to validate the quantitative outcomes and can help in future messaging and communications about the CAP outcomes.

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